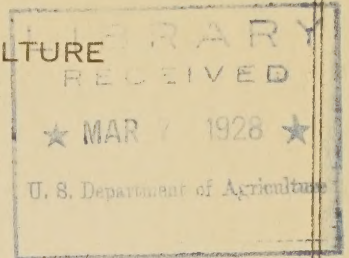


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UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF COOPERATIVE EXTENSION WORK
AND
BUREAU OF PLANT INDUSTRY COOPERATING



VOLUME 6

March, 1928

NUMBER 3

The Extension Pathologist

"TO PROMOTE ECONOMIC CROP PRODUCTION,
IMPROVE THE QUALITY OF PLANT PRODUCTS, AND
REDUCE WASTAGE IN STORAGE, TRANSIT, AND AT THE MARKET"

SPRAY INFORMATION SERVICE

CORN SEED TREATMENTS

KANSAS SEED POTATO TREATMENT PROJECT SUCCESSFUL

SMUT PREVENTION WEEK IN THE SPRING WHEAT AREA

SPRAY DEMONSTRATIONS EFFECTIVE IN INDIA

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OF COOPERATIVE EXTENSION WORK, UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

THE EXTENSION PATHOLOGIST

Volume 6.

March, 1928.

Number 3.

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SPRAY INFORMATION SERVICE

By A. L. Pierstorff, Extension Pathologist, Ohio State University

In January, 1911, Professor H. H. Whetzel delivered before the Massachusetts Horticultural Society an address on "The Local Plant Doctor."

I dare say that at that time few growers and fewer plant pathologists believed Professor Whetzel's predictions or agreed with his point of view.

Today--only seventeen years later--we have seen the fulfillment of his prediction in many States and more States are falling into line each year. The Spray Information Service is an example of using trained pathologists and entomologists in field work with the growers benefited paying most of the bills.

Service an Out-Growth of the World War

The Spray Information Service in N. Y. State was a direct outgrowth of the World War. At that time we were all called upon to conserve as much food as possible and increase the output per acre. The Federal Government appropriated money to hire trained men to go into the more intensive fruit and vegetable sections of the country and advise growers on insect and disease control. N. Y. State had a number of such men.

After the War the Federal funds were largely withdrawn and growers were deprived of this service unless they wished to foot the bills. So well did these field men perform their work that the growers in six counties in N. Y. elected to continue the service. Since that time the number of counties desiring such assistance has gradually increased and now 14 or 15 men are annually employed for the growing season to advise the farmers on disease and insect control. Other States have also taken up the idea and Canada started such an advisory service in 1925.

Methods of Financing

How are these men financed? Different States employ different methods dependent largely on the sources of revenue for such work. In N. Y. several methods are used. In the majority of counties the field man, or spray man as he is locally called, is paid in part by the county extension service, part by the State and a small amount from the federal government. In other counties the particular growers desiring such service pool together to pay for the larger part of the man's salary and expenses, the remainder coming from State and Federal funds.

Trained Men Needed

Where, you ask, do they get 14 or 15 trained men for six months each year. Part of the men are assistant county agents or county agents who formerly were spray service men. There are available in most of our agricultural colleges, graduate students in pathology and entomology who are anxious to do this work. It offers the best type of practical experience for them.

Some of these men are more experienced than others and need but little outside assistance. Others would fail without it. For this reason two spray information service supervisors are provided by the college at Ithaca, one in pathology and another in entomology. It is their duty to see that the field men appointed have the necessary qualifications of knowledge, pleasing personality, experience, ambition, and to see that their recommendations are sound and timely. In a large measure, the success of the spray information service rests with these supervisors.

Weather Forecast Sent Daily

A two or three day weather forecast is sent to each field man daily during the critical period reaching him about 10 p.m. We assume that the field man knows daily by observation the stage of fruit tree and apple scab development. Suppose the apple trees are about pink and apple scab ripe, but most growers would normally not spray for three or four days. The weather telegram says rain two days hence. What does the spray man do?

Spray Notices Sent Promptly

Presumably he has sent to each grower desiring the service a letter describing the pink spray and advising the grower to delay spraying until further notice unless his trees are going into bloom. As soon as the spray man receives the telegram he stamps the date on cards already prepared for the entire mailing list. He then puts them into the post office mail box if his county is fortunately located so that all men to be notified will get their cards by noon of the next day. If not, he must get into his mud-besmeared Ford and drive to the various local post offices returning to his headquarters perhaps at 3 a.m. He can then catch a few hours sleep, get up at 5 a.m. and notify the growers to spray thru the telephone relay. This takes till about 6 a.m. After which he can get a bite to eat, then dash out to his demonstration orchards and apply a spray. These orchards are sprayed as a check on the efficiency of the spray warnings, to avoid any argument as to the proper time of application and to convince skeptical growers of the value of such information. Over a period of years the fruit in these orchards will average close to or over 90% perfect, or free from insect and disease blemishes.

There is a great deal of work to be done in the field of the history of the United States. The first of these is to collect the materials which are necessary for the study of the history of the United States. This is a task which is not yet completed. The second is to organize the materials which have been collected. This is a task which is also not yet completed. The third is to write the history of the United States. This is a task which is also not yet completed.

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Educational Work

Twilight meetings are held by the field men during the growing season. At these meetings the growers are shown the pests and diseases present in the orchard, given their life history and methods of control. As soon as darkness falls the group retires into the home of the grower where the field man brings out his microscope and unfolds to the farmers the mysteries of nature.

During August a "Spray Service" tour is conducted and where these tours are properly organized the number of men attending increases from year to year. The popularity of these tours is sufficient proof of their value.

In New Jersey the fruit growers are sent a timing card for each spray and in Southern Jersey where scab is more of a problem an intensive spray information service was started in 1927. The men receiving this service were highly pleased with the results secured by following this information.

For the past two years in Ohio the spray information service has been doing good work following somewhat the system employed in N. Y. State in respect to having field men located in the fruit counties. The fruit growers are enthusiastic about the service and desire to have it further developed which we hope to do.

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CORN SEED TREATMENTS

By J. R. Holbert, Agronomist, Office of Cereal Crops and Diseases,
Bureau of Plant Industry,
U. S. Department of Agriculture.

The planting of diseased seed corn results in reduced field stands, frequently a weakened vigor of the remaining plants, and a lower yield of grain. The extent of the damage resulting from the use of diseased seed depends on environmental factors, the nature and extent of the disease concerned, and the genetical complex of the corn itself. For several years experiments have been conducted to determine whether or not seed treatments can be used to advantage on corn to control some of the seed-borne diseases. These experiments have been conducted chiefly in Illinois by the Office of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture in cooperation with the Funk Bros. Seed Co. and the Illinois Agricultural Experiment Station.

Many problems have been encountered in selecting suitable corn seed disinfectants. When the studies were first started, several years ago, the treatment of the seed in water solutions of the chemicals gave better results than treating the seed with dust disinfectants then avail-

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able. The difficulties were increased by the fact that laboratory and greenhouse results proved inadequate for the selection of disinfectants that could be used under a wide range of field conditions and with a large number of different varieties of corn. Some treatments were effective in controlling one disease, but ineffective on other diseases. A few disinfectants controlled the seedling-blight diseases but at the same time depressed the yield of the corn grown from good seed. In other cases there was no injury from treating good seed, but only partial disease control. Some disinfectants appeared to be very satisfactory under one set of environmental conditions, but very unsatisfactory under other conditions.

During the past few years much progress has been made in developing dust disinfectants suitable for general use. These better dust disinfectants are a decided improvement over the liquid treatments that gave the better results at the beginning of the investigations. The dust treatments also possess obvious advantage from the standpoint of convenience and safety of application. The better dust disinfectants that are now commercially available for use on corn are Bayer Dust, Improved Samsan Junior, and Merko.

Seed treatment with the above dust disinfectants has proved fairly effective in controlling seedling blights caused by *Diplodia*, *Gibberella*, and *Basisporium*, which are most common in the central portion of the Corn Belt. Seed treatment has resulted in an increased field stand, and frequently in improved vegetative vigor. Under some conditions there have been reductions in the per cent of lodged plants as a result of seed treatment. Occasionally there have been improvements in the quality of the grain. However, the outstanding result following seed treatment is the increase in the quantity of both stover and grain.

Seed treatment appears to be most advantageous when the planting of treated seed happens to be followed by a period of unfavorable weather. In some cases seed treatment has proved especially advantageous in very early planting. There is considerable variation in the beneficial results following seed treatment. Some seed lots contain a higher percentage of diseased seed than others, and some varieties respond more favorably to seed treatment than others. Again there is considerable variation in results from seed treatment under different soil conditions.

The better dusts have given increases in yield ranging from less than 1 bushel to more than 15 bushels per acre, depending on the seed condition, the variety of corn, the productivity of the soil and environmental conditions. The increase in yield following the treatment of the very best seed available has averaged a little less than two bushels. The treatment of well selected, but untested seed has given increases ranging from two bushels to more than five bushels per acre. These increases of from two to five bushels are comparatively small, yet the cost of treatment also is small, being approximately five cents per acre.

Considering the fact that there is a vast corn acreage throughout the Corn Belt that is planted with seed that has not received a care-

ful germination test, and in many cases seed that has not had the benefit of careful selection, it appears that the practice of seed treatment may prove to be of considerable economic importance. This is especially true since treatments now available can be used with safety on the very best seed available.

A summary of the results of experiments with corn seed treatments is being published by the U. S. Department of Agriculture as Circular 34.

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KANSAS SEED POTATO TREATMENT PROJECT SUCCESSFUL
Abstracts from Annual Report for 1927, Submitted by C. E. Graves,
Extension Pathologist, Kansas.

* * * * *

III. PROGRAM OF WORK - EXTENSION PLANT PATHOLOGY PROJECT KANSAS

6A - Vegetable Crops Disease Control

6A1 - Irish Potatoes

- (a) Seed treatment.
- (b) Certified seed.
- (c) Comparing strains of certified seed.
- (d) 4-H Potato Clubs.
- (e) Spindle tuber control.

* * * * *

6A1 - IRISH POTATO DISEASE CONTROL

(1) Status of the Work:

The Kaw Valley potato growers are thoroughly cooperating in carrying out the "More and Better Spuds" program. Extension work in Plant Pathology was first done with potato growers. Their confidence was obtained several years ago and the results are very gratifying. State Board of Agriculture records show a steady increase in profit for the growers since they started cooperating with the Extension Service.

(2) Counties cooperating:

Six Kaw Valley counties are carrying on potato disease control as a major part of their "More and Better Spuds" program. There are three counties carrying it as minor work.

Major Counties

Shawnee
Jefferson
Douglas
Leavenworth
Johnson
Wyandotte

Minor Counties

Riley
Pawnee
Reno

(3) Methods Employed:

Briefly, the following steps were taken to accomplish the year's work in the major counties:

1. January - Lawrence Meeting: Specialist and county agents meet to distribute work in counties.
2. February - County Meetings: Growers meet to discuss past results and locate 1927 demonstrations.
3. March - Plant Plots: Specialist, County Agent, and leaders plant result demonstration plots.
4. May - Inspect Plots: Specialist and County Agent inspect plots to prepare for tour by farmers.
5. June - Potato Tour: Growers visit plots and observe results of demonstrations.
6. July - Harvest Plots: Specialist, county agents, and project leaders harvest plots.
7. November - Potato Show: Exhibits of Kansas Potatoes and Educational Program.

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RESULTS OBTAINED

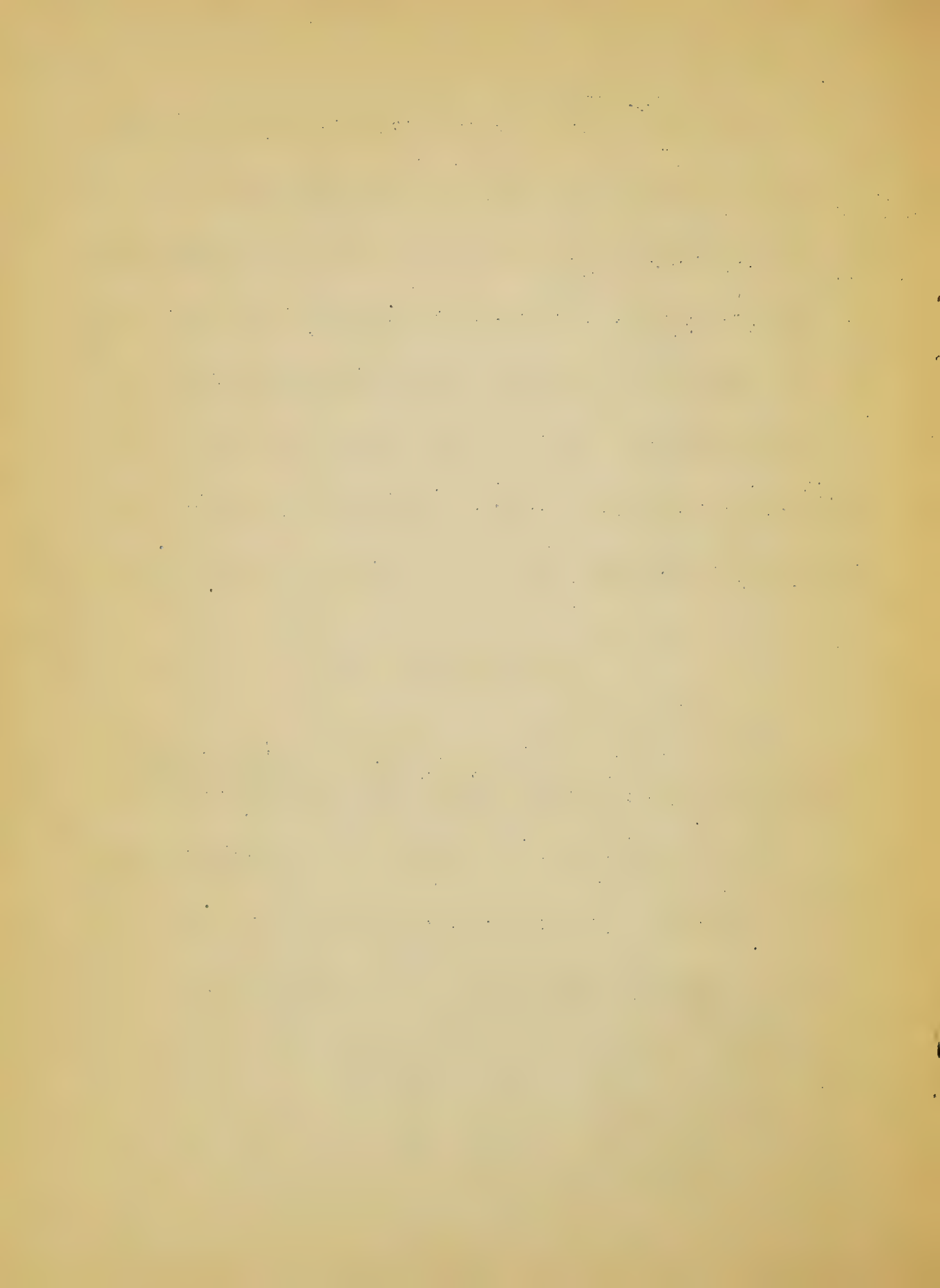
(a) Seed Treatment.

This phase is the oldest one in the Extension Plant Pathology Project. Work was started with Irish potato growers because they were anxious to cooperate. The long time goal was passed in 1926 when 81% of the commercial potato acreage was planted with treated seed.

Most of the seed this year was treated with hot formalin, some with corrosive sublimate, and some with various organic mercury compounds.

The following table is a summary of progress made to date:

Kaw Valley Irish Potato Seed Treatment							
Year	Total	Hot	Corr.	Org.	Acres	%	Increase in Bushels per Acre
	Acreage	Form	Sub	Merc.	Treated	Treated	
1921	17500		2200		2200	13%	19
1922	18000		3000		3000	17%	40
1923	16000	500	4000		4500	28%	44
1924	18000	700	6000		6700	37%	32
1925	16000	9265	1809		11074	69%	53.6
1926	14500	9288	2575		11863	81%	19.7
1927	15000	9000	2500	720	12220	81%	32.4



The average increase in yield per acre from treating seed this year was 32.4 bushels per acre. On the 12,220 acres planted with treated seed this was an increase of 395,928 bushels of potatoes for the State. These potatoes sold for an average price of 75¢ per bushel. This being true, seed treatment earned Kaw Valley potato growers a total of \$296,946.

The following table shows the result demonstrations conducted in the Kaw Valley on seed treatment.

1927 - Seed Treatment Result Demonstrations					
Local	:	:	Yield bushel per acre:		
Demonstration	:	County	Treated	Untreated	Increase
Fred Laptad	:	Douglas	228.9	193.8	35.1
Fred Laptad	:	"	153.9	170.4	-16.5
Abe Enoch	:	Shawnee	349.2	301.5	47.7
I. H. Correl	:	Douglas	209.1	111.0	98.1
I. H. Correl	:	"	124.2	111.0	13.2
Sherman Bell	:	Jefferson	217.2	209.7	8.5
Robert Zimmer	:	Wyandotte	189.0	118.5	70.5
Floyd Cochran	:	Shawnee	215.4	212.7	2.7

In the Arkansas Valley and in other parts of the State there were several seed treatment demonstrations conducted.

The following table shows the result of the seed treatment demonstrations conducted outside the Kaw Valley.

1927 Seed Treatment Demonstrations Outside the Kaw Valley						
Local	:	:	:	Bushel per acre :		
Demonstration	:	Address	County	Treated	Untreated	Increase
	:					
A. L. Stockwell	:	Larned	Pawnee	159.0	119.0	20.
F. C. Browne	:	Burdette	"	244.0	210.0	34.
F. C. Browne	:	"	"	138.0	134.0	4.

A. L. Stockwell, Larned, Kansas, said, "A marked increase in yield was noted in the treated plots over those not treated. This advantage was not only apparent in yield but also in the quality of the potatoes, those grown from untreated seed tending to be somewhat scabby."

SMUT PREVENTION WEEK IN THE SPRING WHEAT AREA

February 26 to March 3 is Smut Prevention Week in the spring wheat area. For more than a month extension workers and business groups have been busy preparing for a continuation of the good work done during the last two years on wheat seed treatment. The Northwest Grain Smut Prevention Committee of Minnesota has printed a very fine poster and small folder for use in the work and these have been distributed liberally throughout the territory concerned. Every effort is being made to demonstrate to farmers that it pays to treat seed wheat every year.

In this connection the following copy of a letter which suggests one way in which the elevator manager may effectively promote seed treatment is of interest.

F. C. M.

ATLAS ELEVATOR CO.
Grain-Flour-Coal.

Redfield, S.D., Feb. 10, 1928.

Northwest Smut Prevention Committee,
Minneapolis, Minn.

Dear Sirs:

The writer is organizing for Smut Prevention Week.

Treating Demonstrations are not the main factor this year. Every farmer knows how and what to do. The main idea is to get enough pressure put out so that the farmers realize the necessity of treating their seed grain, which they may think is smut-free.

A year ago I organized several counties on the plan of sending out a circular letter, signed by every elevator man, in the county, and the letter sent to every farmer in the county. I found that this brought farmers to a realization of the importance of seed treatment, because they expected to see one or more of these elevator men in the following fall, and knew that discounts would come if their grain contained smut.

With this letter was mailed the circulars that you have printed, as well as any matter that the County Agent wished to send too.

Today I organized Potter County on the above basis and also Spink County. Will do the same thing in Faulk County Monday.

Have always worked with the County Agents on this matter.

Yours truly,

A. A. Moritz,
Aud. Atlas Elevator Co.

SPRAY DEMONSTRATIONS EFFECTIVE IN INDIA

Reprinted from Extension Service Circular 67, January, 1928,
Foreign Agricultural Extension Activities.

By J. M. Steadman, Associate Agriculturist, Extension Studies,
Office of Cooperative Extension Work.

One of the striking instances of the success of demonstration work in Bombay is the adoption of Bordeaux mixture as a spray for grape-vine mildew in a district where grape growing, which in 1908 was dying out, has again become profitable. Demonstrations conducted by the department for four years in cooperation with a prominent grape grower succeeded in enlisting the interest of the farmers of the community, who at first had been suspicious of the new method. The great saving resulting from the comparatively small expense for treatment has led to the general use of Bordeaux by the grape growers of this section.

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WITH THE STATES

Arizona.

Cotton delinting: A large amount of cottonseed for planting this year will be delinted under the supervision of the plant pathologist of the Arizona Experiment Station. The seed is treated with concentrated sulphuric acid by means of a machine invented at the Station and now in use for several years. The treatment eliminates the angular leaf-spot organism and other germs and spores which dwell in the lint. Farmers who have used the seed also find that germination is improved, stands are healthier, and the ease in handling decreases time required for planting. It is significant that planters who listed their seed for treatment when the machine was first operated were first to list seed for treatment again this year.

J. G. Brown.

Arkansas.

New Building. The Department of Plant Pathology of the University of Arkansas is now located in a new fireproof building together with the Departments of Agronomy, Horticulture, Entomology, Rural Sociology, and the Agricultural Library. The department is equipped with built-in furniture throughout and all offices are equipped with gas, heating current, hot and cold water and distilled water so that they are available as research laboratories as well as for office work.

Peach leaf curl which has been very prevalent in Arkansas the past two seasons, was formerly controlled by the use of the dormant lime sulphur spray. Growers switched very suddenly to the use of lubricating oil for scale control, apparently without realizing that "curl" was also being controlled by the lime sulphur spray. Excellent control is now being obtained by the use of lubricating oil emulsion Bordeaux.

V. H. Young.

Colorado.

Smut Control: Considerable work has been done to extend the copper carbonate method of seed treatment to the wheat growers of Colorado. As a result of these campaigns, an extensive check up was made this last season. In this survey of some 20,000 acres of wheat it was found that commercially pure copper carbonate reduced the percentage of smut to an average of 0.7 per cent; formaldehyde 1.2 per cent; blue vitrol, 3.4 per cent; and low grades of copper carbonate 2.8 per cent. Where no treatment was used the loss was as high as 30 to 50 per cent. Where treated seed was planted late on infected soil the percentage of smut was high.

Colorado (cont'd.)

Rust Control: In the past few years many heavy local epidemics of stem rust have been observed coming from the common barberry. This past season 223 common barberries were found on 34 properties most of which were bushes escaped from cultivation. To date, 40,233 bushes, sprouting bushes, and seedlings have been eradicated from the State of Colorado. By the eradication of this source of inoculum, the epidemics have been cut down considerably. In the past four years the stem rust losses have been very low in Colorado.

E. A. Lungren.

Delaware.

Sweet potato diseases. We are launching a campaign to control the stem wilt and other diseases of the sweet potato. Press material and a general letter is being sent to all sweet potato growers covering the following items: (1) Select disease-free seed. (2) Clean the seed bed and use new soil. (3) Treat the seed. (4) Rotate the crop and avoid sick lands. (5) Grow seed from slips. (6) Remove wilted plants from seed fields. (7) Select only healthy hills for seed at harvest time. Several follow-up letters will be sent out during the growing season.

T. F. Manns.

Idaho.

(Excerpt from THE PROJECT LETTER, Federal Grain Supervision,
Jan. 27, 1928, Vol. IX, No. 4.)

35,000 acres of land was seeded in Power County, Idaho, this fall with wheat treated with copper carbonate for smut control, according to County Agent L. E. Tillotson. Nearly two tons of the chemical was used in treating the seed for this acreage.

The copper carbonate treatment is being readily adopted by the farmers of the county as a result of comparative demonstrations conducted in various parts of the county in the past few years.

Indiana.

Plant disease schools are the order of the day in Indiana. Corn schools given in cooperation with Agronomy Department,-- 13 in number, will be given in February. Weed and plant disease schools given in cooperation with A. A. Hansen,-- 11 in number, will be given in March. Plant disease and insect schools with J. J. Davis, two will be given. Flower disease schools are to be given at South Bend and Richmond, in cooperation with A. A. Hansen and J. J. Davis.

C. T. Gregory.

Kansas.

Kansas holds wheat schools: Two day District Training Schools were held for wheat and sorghum smut control leaders at Wichita, Dodge City and Salina the last week in January. Ten leaders were invited from each of 22 counties to attend the school. Including the county agents, a total of 235 men attended the full two days. A banquet was scheduled for each evening as an added attraction to hold the men over night.

The last half day was consumed by each county delegation getting together with the County Agent and working out a definite plan of campaign for the coming year, including demonstrations and test plots, publicity and personal work to be done by each man.

C. E. Graves

Maryland.

Cantaloupe blight: A cantaloupe conference called by the Del-Mar-Va Marketing Bureau January 26, at Salisbury, was addressed on the subject of the control of cantaloupe diseases. The conference was attended by approximately two hundred cantaloupe growers from Maryland and Delaware. The chief fact brought out by the conference was that the cantaloupe industry on the Del-Mar-Va Peninsula can not continue to prosper and meet competition from other cantaloupe growing regions unless the practice of marketing green fruit and fruit from blighted vines is discontinued. This means that the growers of cantaloupes on the Del-Mar-Va Peninsula must not pick their fruit too green and must follow a regular spraying or dusting program every year.

R. A. Jehle.

Mississippi.

Certified seed potatoes: Extensive work is now being carried on at this Station in connection with the control of virus diseases of potatoes by the use of certified seed. Strains of potatoes from the certification areas in the North and West are being extensively tested in connection with this work.

Pecan scab is also receiving attention by the Experiment Station and Plant Board and dusting and spraying experiments are being conducted for the control of this outstanding pecan disease.

Seed disinfection: The use of organic mercurics and other seed disinfectants are being extensively studied at this Station with various economic plants, such as corn, cotton, sweet potatoes and various ornamental plants.

The sugar cane mosaic disease is also being studied in cooperation with the Office of Sugar Investigations and work on this project deals largely with the behavior of the so-called resistant varieties in the

Mississippi (cont'd.)

mosaic regions in the coastal plain section of the State. Approximately one hundred varieties and strains of sugar cane are under test at this Station.

Cotton Wilt. The effect of fertilizers upon cotton wilt and the development of resistant varieties of both staple and short cottons are also receiving attention in this State and favorable progress has been made along both of these lines of study in connection with this disease.

Crown rust of oats. A study of the resistance and susceptibility of oats to crown rust is being made as a cooperative project between this Department and the Office of Cereal Disease Investigations. We had 187 strains and varieties planted prior to the freeze in December but many of them were killed. At this time, however, it is our plan to make a spring planting this month with the hope of getting additional data on this project.

D. C. Neal.

North Carolina.

Tobacco diseases. During January and the early part of February, twenty meetings were held for a discussion of tobacco diseases, together with other problems related to tobacco production, which were attended by between two and three thousand tobacco growers. Local newspapers supported this program by giving much space to an account of the work.

G. W. Fant.

Pennsylvania.

Potato Club. 400 Bushel Potato Club, 1927: One hundred and eighty-seven Keystone potato growers made the Club in 1927. Six of these growers had yields of over 600 bushels to the acre and thirty-six had yields of over 500 bushels. Practically all used disease-free seed and sprayed very systematically with an 8-8-100 home-made Bordeaux mixture. The "600" bushel men averaged 14.5 applications; the 500 bushel men 13.2 applications and the 400 men 11.2 applications.

Degenerative diseases of raspberries: For the past five years considerable time has been devoted to the development of disease-free sources of raspberry plants within the State. The work is being carried on in 38 counties and approximately 510,000 disease-free plants will be ready for distribution during the Spring of 1928. Some of the black cap plantations are now in their fourth year of production and still producing well.

Black caps and reds should not be planted close together in this State as the mosaic of the reds spreads very rapidly to the black caps.

Virginia.

Cucumber Mosaic. On January 25 a meeting of County Agents, members of the Norfolk Experiment Station, and State Extension Division was held in Norfolk to discuss and make plans for the eradication of cucumber mosaic which has been quite prevalent in certain counties during the past few years. Following conferences of extension and research workers, Mr. Meier, Extension Plant Pathologist of the U. S. Department of Agriculture, gave an illustrated lecture to growers showing how this work has been carried on in other States.

It is planned to start only a few demonstrations in about three counties of the trucking section.

S. B. Fenne.

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Articles, news notes, or suggestions with regard to subjects that might profitably be discussed in this news sheet, should be addressed to:

F. C. Meier,
Extension Plant Pathologist,
Bureau of Plant Industry,
U. S. Department of Agriculture,
Washington, D. C.

